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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/697,745	10/30/2003	Wuping Liu	CS03-025	8763

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EXAMINER

THAI, LUAN C

ART UNIT PAPER NUMBER

2891

DATE MAILED: 06/03/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

H:A

# **Office Action Summary**

Application No.

10/697,745

Applicant(s)

LIU ET AL.

Examiner

Luan Thai

Art Unit

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## **Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## **Status**

- 1) ☒ Responsive to communication(s) filed on 14 April 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## **Disposition of Claims**

- 4) ☒ Claim(s) 1-64 is/are pending in the application.
- 4a) Of the above claim(s) 35-64 is/are withdrawn from consideration.
- 5) ☒ Claim(s) 9,10,12,14,17,21-23,25,27,30 and 34 is/are allowed.
- 6) ☒ Claim(s) 1-8,11,13,15,16,18-20,24,26,28,29 and 31-33 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## **Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 30 October 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

## **Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

## **Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date 1/29/04.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

## **DETAILED ACTION**

### ***Election/Restrictions***

1. Applicant's election with traverse of group II, claims 1-34 filed April 14, 2005 is acknowledged. The traversal is on the ground(s) that the product and process patent claims should be prosecuted as part of the same patent application because of the close interrelationship between the product and the process patent claims. This is not found persuasive because these inventions are distinct for the reasons as previously mentioned on Election/Restriction paper dated 3/21/05 and have acquired a separate status in the art as shown by their different classification, restriction for examination purposes as indicated is proper. Furthermore, the examiner respectfully submits that searching/examining the Group II method invention in addition to the elected Group I device invention would, in fact, be more than a slight added burden.

The requirement is still deemed proper and is therefore made FINAL.

### ***Information Disclosure Statement***

2. The Information disclosure Statement filed on 01/29/04 has been considered.

### ***Claim Rejections - 35 USC § 112***

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claims 3, 5, 7-8, 11, 13, 15-16, 18-20, 24, 26, 28-29, and 31-33 are rejected under 35

U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In claims 3, 5, 7-8, 11, 13, 15-16, 18-20, 24, 26, 28-29, and 31-33, the recitation, such as "*wherein the semiconductor surface is a printed circuit board, a flex circuit, a metallized substrate, a glass substrate or a semiconductor device mounting support*" is unclear. One acceptable form of alternative expression, which is commonly referred to as a Markush group, recites members as being "selected from the group consisting of A, B and C." See *Ex parte Markush*, 1925 C.D. 126 (Comm'r Pat. 1925).

Correction is required.

### ***Claim Rejections - 35 USC § 102***

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.  
(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

6. Claims 1-8 are rejected under 35 U.S.C. 102(e) as being anticipated by Morrow (6,872,666).

The figures and reference numbers referred to in this office action are used merely to indicate an example of a specific teaching and are not to be taken as limiting.

Regarding claims 1-8, Morrow (see specifically figures 1-2) disclose a method for creation of an interconnect pattern, comprising: providing a layer of copper (101) (Col. 2, lines 26+) over a semiconductor surface (100) made of semiconductor substrate or any structure (Col. 2, lines 22+), a layer of silicon oxynitride (SiON) (102) having been deposited over the copper

layer (101); depositing a layer (103) of polymer, polyimide, fluorinated polyimide, polysilsequioxane, benzocyclobutene, parylene n, parylene f, or amorphous polytetrafluoroethylene (Col. 2, lines 49+), over the layer of silicon oxynitride (102) (see figures 1d and 2d); patterning and developing the layer (103) (figures 1e-1f and 2e), creating an interconnect pattern therein, exposing the layer (102) (Col. 4, lines 62+, Col. 5, lines 15+, figure 2f); removing the exposed layer (102) (figures 1g and 2g); and filling the interconnect pattern with a conductive material (105) (figures 1h and 2h, Col. 5, lines 48+). Note that the layer of silicon oxynitride (SiON) (102) and the polyimide layer (103) are considered as the claimed “Anti Reflective Coating (ARC) layer” and “Photo-Active Dielectric (PAD) layer”, respectively, as evidenced by Applicant’s Specification, page 15, last paragraph, and page 12, third and fifth paragraphs.

Wang et al. (US Pat. 6,429,116, Figs. 1-11, Col. 6, lines 65+, Col. 7, lines 1-5 and lines 10-22, Col. 8, lines 25+) also teaches a method for creation of an interconnect pattern identical to Morrow’s method; therefore, the method claims 1-8 are also rejected under 35 U.S.C. 102(b) as being anticipated by Wang et al. for the similar reasons detailed above.

***Allowable Subject Matter***

7. Claims 9-10, 12, 14, 17, 21-23, 25, 27, 30, and 34 are allowed.
8. Claims 11, 13, 15-16, 18-20, 24, 26, 28-29, and 31-33 would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. 112, 2nd paragraph, set forth in this Office action.

9. The following is a statement of reasons for the indication of allowable subject matter:

The prior art taken either singly or in combination fails to anticipate or fairly suggest at least the method steps of: a) *depositing a second layer of Photo-Active Dielectric (PAD) over the first layer of Photo-Active Dielectric (PAD), the second layer of Photo-Active Dielectric comprising a Photo-Active Dielectric material having a different chemical composition than the first layer of Photo-Active Dielectric; first patterning and developing the second layer of PAD, creating a trench pattern of a dual damascene pattern therein, exposing the first layer of PAD; second patterning and developing the exposed first layer of PAD, creating a via pattern of a dual damascene pattern therein aligned with the trench pattern, the second patterning and developing comprising a different type of lithographic exposure than the first patterning and developing, exposing the layer of ARC, as recited in claim 9; and b) depositing a second layer of Photo-Active Dielectric over the second layer of ARC, the second layer of Photo-Active Dielectric comprising a Photo-Active Dielectric material having a different chemical composition than the first layer of Photo-Active Dielectric, first patterning and developing the second layer of PAD, creating an trench pattern of a dual damascene pattern therein, exposing the second layer of ARC, removing the exposed second layer of ARC, exposing the first layer of PAD, second patterning and developing the first layer of PAD, creating a via pattern of a dual damascene pattern therein aligned with the trench pattern, the second patterning and developing comprising a different type of lithographic exposure than the first patterning and developing, exposing the first layer of ARC, as recited in claim 22.*

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10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Luan Thai whose telephone number is 571-272-1935. The examiner can normally be reached on 6:30 AM - 5:00 PM, Monday to Thursday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Bradley W. Baumeister can be reached on 571-272-1722. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



**Luan Thai**

Primary Examiner

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May 30, 2005